



Sennheiser electronic GmbH & Co. KG,
Am Labor 1, 30900 Wedemark

An installation for controlling aids for
public functions

The invention relates to an installation for controlling aids for public functions, in particular acoustic irradiation and/or illumination systems, having a control unit to which at least one movable object, in particular an (audio) signal source, as well as one or more aids to be controlled can be connected, and comprises the control means for controlling the aids.

Installations of the above type are known. A known installation is constructed as a mixing console and disposed in a performance area comprising a stage area as well as a public area. The performance area has a closed construction, for instance like a congress hall, or in the open air, for instance as a stadium. The mixing console serves to control an acoustic irradiation installation which amplifies one or more audio signals from an (audio) signal source and fills the public area and also, where appropriate, the stage area with the amplified audio signal. The acoustic irradiation is performed by means of several loudspeakers of the acoustic irradiation installation which are provided in the performance area. The loudspeakers are each disposed in such a manner that they radiate the amplified audio signal in particular into a predeterminate section of the public area and/or of the stage area.

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The amplitude of the amplified audio signal can be adjusted by means of the mixing console. The mixing console is provided for operation by a sound engineer.

The sound engineer performs the adjustment of the amplitude in accordance with each situation on the stage which he observes in such a manner that the overall impression in the performance area, in particular in the public area, which is produced by audio signals radiated by all the loudspeakers, is complementary to the situation in the stage area. The amplified audio signal is supplied to each loudspeaker from the mixing console.

In addition, in the known installation a control of one or more spotlights is provided. The spotlight is disposed in the performance area in such a manner that it can throw a cone of light in a narrow dihedral angle in the stage area. The spotlight is rotatably mounted around a vertical axis and a horizontal axis and the dihedral angle that can be radiated can be adjusted by a lighting engineer. Depending on the situation in the stage area, for instance the position of an actor on the stage, the alignment of the spotlight is performed by the lighting engineer in such a manner, for instance, that the dihedral angle radiated from the spotlight hits the actor.

The known installation consequently requires the attentiveness of the staff operating the control unit, i.e. of the sound engineer at the mixing console and of the lighting engineer at the spotlight, so that the control of the loudspeakers and of the spotlight is performed according to the situation in the stage area.

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This object is achieved in accordance with the invention with the installation of the type mentioned at the beginning in that a locating device for locating a relevant position, for instance the position of an actor is provided, which outputs a position signal indicating the relevant position to the control unit and in that the control unit controls the aid or aids in dependence on the position signal.

So that the control unit controls the aids in dependence on the position signal, control functions determining the interaction can be preset in the device. A control operation is repeatable according to the predetermined control function. With the installation specified by the invention a higher degree of precision can be achieved in the control of the aids according to the respectively predetermined control function than with manual control.

The locating device of the installation according to the invention preferably has fixed radio beacon transmitters to be arranged spaced from one another for transmitting

The locating device has a mobile receiver for receiving the radio beacon signals and an output unit which derives the position signal from the received radio beacon signals and outputs it. The fixed radio beacon transmitters are preferably constructed as high-frequency transmitters and the mobile receiver is accordingly constructed as a high-frequency receiver.

The position of the mobile receiver of the radio beacon signals may preferably be determined by means of the radio beacon signals transmitted from the radio beacon transmitters. In one embodiment this determination is performed in accordance with the so-called triangle process or another process which is known to a person skilled in the art for locating systems. The received

radio beacon signals are placed in relationship or linked with one another.

In a particularly preferred embodiment of the invention, the respective position of each receiver can be determined by means of several receivers, possibly independent of one another, and can be outputted to the control unit.

In accordance with another preferred embodiment of the invention, the fixed radio beacon transmitters transmit the radio beacon signals in the GPS format and the mobile receiver is constructed as a GPS receiver. The GPS receiver is simple and cheap to produce or obtain from commercially available structural elements.

The mobile transmitter is preferably constructed as a high-frequency transmitter and the associated receiver accordingly as a high-frequency receiver. In this embodiment the mobile transmitter can be carried in a particularly simple manner, for instance by an actor, without the freedom of movement of the actor being restricted, for instance by a connecting cable. Moreover, this embodiment does not subject the actor to the restriction of there having to be a free view between transmitter and receiver, as is required in an infrared system, for instance.

The control unit may preferably receive derived position signals from several locating devices and process them.

This embodiment of the invention is quite particularly suitable for performances in which the locating device is provided to determine several relevant positions. The

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In accordance with another particularly preferred embodiment of the invention, the mobile receiver, the output unit and the mobile transmitter are constructed as a portable compact appliance. The portable compact appliance is worn, for instance, on the actor=s body or in a pocket in the clothing of the actor.

Moreover, the energy supply can be taken from a common source, such as a battery disposed in the housing of the microphone.

In an alternative embodiment of the invention, a mobile transmitter is provided and fixed receiving beacons are provided to receive the signal transmitted from the

mobile transmitter. The signal transmitted from the mobile transmitter is received by the fixed receiving beacons as a received signal. A position signal with an item of information relating to the position of the mobile transmitter can be determined from the large number of received signals.

Finally a microphone, in particular for use at a public function, with an electroacoustic transducer for receiving an audio signal in a transmitter for transmitting an audio signal, and with a locating device as specified by the invention.

An exemplified embodiment of the invention is explained in further detail below by means of the drawings.

Figure 1 shows as a diagrammatical model a perspective view of a performance area in which aids are disposed, which are actuated by an installation according to the invention;

Figure 2 shows a diagrammatical representation of a longitudinal section through a microphone; and

Figure 3 shows a diagrammatical representation of a mixing console.

The performance area 2 represented in Figure 1 comprises a stage area 4 and a public area 6, which are separated from one another at a boundary surface 7. A left loudspeaker 8 and a right loudspeaker 9 are disposed in the region of the boundary surface 7 in such a manner that they fill the public area 6 in particular with

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Moreover, disposed in the public area 6 is a spotlight 12, which throws a cone of light in a narrow dihedral angle 13 and in particular beams into the stage area 4.

A control unit constructed as a mixing console 20 is disposed in the public area 6 in a region lying opposite the boundary surface 7. The mixing console 20 is connected to an amplifying facility (not represented), which serves to amplify audio signals. The mixing console 20 comprises regulators to regulate the amplitude of amplified audio signals. The left loudspeaker 8, the right loudspeaker 9 and the monitor loudspeaker 10 are connected to the mixing console 20. Amplified and regulated audio signals can be outputted from the mixing console 20 to the loudspeakers 8, 9, 10.

The microphone is detachably fixed to a stand 24 and can be released from the stand 24 by a person in the stage area 4, for instance an actor, and be carried through the

of the microphone 22 is a GPS receiver 30, which is provided to receive the signals transmitted from the radio beacon transmitters 26, 26', 28, 28'. An output unit 32 for determining and outputting a position signal derived from the radio beacon signals is also disposed in the housing of the microphone 22. An accumulator for energy supply can be inserted in a battery compartment 40. The output unit 32 delivers the position signal to the high-frequency transmitter 34 of the microphone 22 which transmits the position signal. The transmitted position signal is received by the high-frequency receiver of the amplifying facility (not represented) and is transmitted to the mixing console 20.

A data processing system 36 with a memory unit 38 is disposed in the mixing console 20 represented in Figure 3. The data processing system 36 determines from the position signal - preferably for three dimensions - the positional data of the GPS receiver 30 of the microphone 22. The data processing system 36 performs a control function program stored in the memory unit 38. By using the positional data as parameters, the control function program 36 outputs a first group of control values, which serve to regulate the amplitude of the amplified audio signals delivered by the loudspeakers 8, 9, 10. In accordance with a determined control function program, the amplitude of the audio signal outputted from the left loudspeaker 8 is regulated to be larger than the amplitude of the audio signal outputted from the right loudspeaker 9 when the GPS receiver 30 of the microphone 22 is closer to the left loudspeaker 8 than to the right loudspeaker 9. The amplitude of the audio signal delivered by the monitor loudspeaker 10 is regulated to

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Moreover, the control function program outputs a second group of control values, which serve to actuate the drives (not represented) for the rotation of the spotlight 12 around the vertical and the horizontal axes 14 and 15 respectively. The spotlight 12 is aligned in accordance with a determined control function program so that the centre axis of the dihedral angle 13 of the cone of light intersects the position of the GPS receiver 30 in the housing of the microphone 22 and the actor is illuminated in the cone of light of the spotlight 12.

Claims

1. An installation for controlling aids (8, 9, 10, 12) for public functions, in particular acoustic irradiation and/or illumination systems, with a control unit to which at least one mobile object, in particular an (audio) signal source, as well as one or more aids to be controlled can be connected, and comprises control means for controlling the aids, **characterised in that** a locating device is provided to locate a relevant position, for instance the position of an actor, which outputs a position signal indicating the relevant position to the control unit, **and in that** the control unit controls the aid or aids (8, 9, 10, 12) in dependence on the position signal.
2. An installation according to Claim 1, **characterised in that** the locating device comprises fixed radio beacon transmitters (26, 26', 28, 28'), to be disposed spaced from one another, for transmitting radio beacon signals, a mobile receiver (30) for receiving the radio beacon signals and an output unit (32), which derives the position signal from the received radio beacon signals outputs it.
3. An installation according to Claim 2, **characterised in that** a mobile transmitter (34), with which a receiver of the control unit is associated, is provided to output the position signal to the control unit.

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4. An installation according to Claim 3,
characterised in that the fixed radio beacon transmitters (26, 26', 28, 28') are constructed as high-frequency transmitters and the mobile receiver (30) is accordingly constructed as a high-frequency receiver.
5. An installation according to Claim 3 or 4,
characterised in that the fixed radio beacon transmitters (26, 26', 28, 28') transmit the radio beacon signals in the GPS format and the mobile receiver (30) is constructed as a GPS receiver.
6. An installation according to one of Claims 3 to 5,
characterised in that the mobile transmitter (34) is constructed as a high-frequency transmitter and the associated receiver is accordingly constructed as a high-frequency receiver.
7. An installation according to one of the preceding Claims,
characterised in that the control unit can receive derived position signals from several locating devices and process them.
8. An installation according to one of the preceding Claims,
characterised in that the mobile receiver (30), the evaluation unit (32) and the mobile transmitter (34) are constructed as a portable compact appliance.
9. An installation according to one of the preceding Claims,

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10. A control unit according to Claim 9,
characterised in that the mobile receiver (30), the evaluation unit (32) and the mobile transmitter (34) are disposed in the housing of the microphone (22).
11. A microphone (22), specifically for use at a public function, with
an electroacoustic transducer for receiving an audio signal and a transmitter for transmitting an audio signal,
characterised by a mobile receiver (30) for receiving radio beacon signals, an output unit (32) for deriving and outputting a signal from the received radio beacon signals and a transmitter (34) for outputting the derived signal to a control unit for controlling aids.

Abstract

The invention provides an installation for controlling aids (8, 9, 10, 12) for public functions, in particular sound irradiation and/or illumination systems. The installation comprises a control unit. At least one mobile object, in particular an (audio) signal source, as well as one or more aids to be controlled, can be connected to the control unit. The installation comprises control means for controlling the aids. Provided in the installation is a locating device for locating a relevant position, for instance the position of an actor, which outputs a position signal indicating the relevant position to the control unit. Moreover, the control unit controls the aid or aids (8, 9, 10, 12) in dependence on the position signal.

(Fig. 1)

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S/N 09/706585

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Niehoff et al.	Examiner:	UNKNOWN
Serial No.:	09/706585	Group Art Unit:	TO BE ASSIGNED
Filed:	11/3/00	Docket No.:	635.324US01
Title:	DEVICE FOR CONTROLLING EQUIPMENT FOR PUBLIC EVENTS		

CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described herein, are being deposited in the United States Postal Service, as first class mail, with sufficient postage, in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on March 30, 2001

Michael B. Lasky
Name

[Signature]
Signature

PRELIMINARY AMENDMENT

Box MISSING PARTS
Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Please enter the following preliminary amendment into the above-referenced application.

ABSTRACT

Please insert the attached abstract into the application as the last page thereof.

CLAIMS

Please amend claims 5,6,7,8 and 9 as follows. A clean copy of the entire set of claims is included below. A marked up copy of the amended claims is included in Appendix A.

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1. An installation for controlling aids (8, 9, 10, 12) for public functions, in particular acoustic irradiation and/or illumination systems, with a control unit to which at least one mobile object, in particular an (audio) signal source, as well as one or more aids to be controlled can be connected, and comprises control means for controlling the aids,
characterised in that a locating device is provided to locate a relevant position, for instance the position of an actor, which outputs a position signal indicating the relevant position to the control unit,
and in that the control unit controls the aid or aids (8, 9, 10, 12) in dependence on the position signal.
2. An installation according to Claim 1,
characterised in that the locating device comprises fixed radio beacon transmitters (26, 26', 28, 28'), to be disposed spaced from one another, for transmitting radio beacon signals, a mobile receiver (30) for receiving the radio beacon signals and an output unit (32), which derives the position signal from the received radio beacon signals outputs it.
3. An installation according to Claim 2,
characterised in that a mobile transmitter (34), with which a receiver of the control unit is associated, is provided to output the position signal to the control unit.
4. An installation according to Claim 3,

characterised in that the fixed radio beacon transmitters (26, 26', 28, 28') are constructed as high-frequency transmitters and the mobile receiver (30) is accordingly constructed as a high-frequency receiver.

5. (Amended) An installation according to Claim 3,
characterised in that the fixed radio beacon transmitters (26, 26', 28, 28') transmit the radio beacon signals in the GPS format and the mobile receiver (30) is constructed as a GPS receiver.
6. (Amended) An installation according to Claim 3,
characterised in that the mobile transmitter (34) is constructed as a high-frequency transmitter and the associated receiver is accordingly constructed as a high-frequency receiver.
7. (Amended) An installation according to Claim 1,
characterised in that the control unit can receive derived position signals from several locating devices and process them.
8. (Amended) An installation according to Claim 1,
characterised in that the mobile receiver (30), the evaluation unit (32) and the mobile transmitter (34) are constructed as a portable compact appliance.
9. (Amended) An installation according to Claim 1,
characterised in that the (audio) signal source is constructed as a microphone (22).

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10. A control unit according to Claim 9,
characterised in that the mobile receiver (30), the
evaluation unit (32) and the mobile transmitter (34) are
disposed in the housing of the microphone (22).
11. A microphone (22), specifically for use at a public
function, with
an electroacoustic transducer for receiving an audio signal
and a transmitter for transmitting an audio signal,
characterised by a mobile receiver (30) for receiving radio
beacon signals, an output unit (32) for deriving and
outputting a signal from the received radio beacon signals
and a transmitter (34) for outputting the derived signal to
a control unit for controlling aids.

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REMARKS

The above preliminary amendment is made to insert an abstract page into the application and to remove multiple dependencies from claims 5,6,7,8 and 9.

Applicant respectfully requests that this preliminary amendment be entered into the record prior to calculation of the filing fee and prior to examination and consideration of the above-identified application.

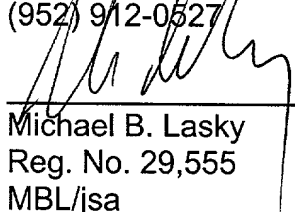
If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicant's attorney of record, Michael B. Lasky at 952-912-0527.

Respectfully submitted,

Altera Law Group, LLC
6500 City West Parkway, Suite 100
Minneapolis, MN 55344-7701
(952) 912-0527

Date: March 30, 2001

By:



Michael B. Lasky
Reg. No. 29,555
MBL/jsa

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1. An installation for controlling aids (8, 9, 10, 12) for public functions, in particular acoustic irradiation and/or illumination systems, with a control unit to which at least one mobile object, in particular an (audio) signal source, as well as one or more aids to be controlled can be connected, and comprises control means for controlling the aids,
characterised in that a locating device is provided to locate a relevant position, for instance the position of an actor, which outputs a position signal indicating the relevant position to the control unit,
and in that the control unit controls the aid or aids (8, 9, 10, 12) in dependence on the position signal.
2. An installation according to Claim 1,
characterised in that the locating device comprises fixed radio beacon transmitters (26, 26', 28, 28'), to be disposed spaced from one another, for transmitting radio beacon signals, a mobile receiver (30) for receiving the radio beacon signals and an output unit (32), which derives the position signal from the received radio beacon signals outputs it.
3. An installation according to Claim 2,
characterised in that a mobile transmitter (34), with which a receiver of the control unit is associated, is provided to output the position signal to the control unit.

4. An installation according to Claim 3,
characterised in that the fixed radio beacon transmitters (26, 26', 28, 28') are constructed as high-frequency transmitters and the mobile receiver (30) is accordingly constructed as a high-frequency receiver.
5. (Amended) An installation according to Claim 3 [or 4],
characterised in that the fixed radio beacon transmitters (26, 26', 28, 28') transmit the radio beacon signals in the GPS format and the mobile receiver (30) is constructed as a GPS receiver.
6. (Amended) An installation according to [one of] Claim[s] 3 [to 5],
characterised in that the mobile transmitter (34) is constructed as a high-frequency transmitter and the associated receiver is accordingly constructed as a high-frequency receiver.
7. (Amended) An installation according to [one of the preceding Claims] Claim 1,
characterised in that the control unit can receive derived position signals from several locating devices and process them.
8. (Amended) An installation according to [one of the preceding Claims] Claim 1,
characterised in that the mobile receiver (30), the evaluation unit (32) and the mobile transmitter (34) are constructed as a portable compact appliance.

9. (Amended) An installation according to [one of the preceding Claims] Claim 1,
characterised in that the (audio) signal source is constructed as a microphone (22).
10. A control unit according to Claim 9,
characterised in that the mobile receiver (30), the evaluation unit (32) and the mobile transmitter (34) are disposed in the housing of the microphone (22).
11. A microphone (22), specifically for use at a public function, with
an electroacoustic transducer for receiving an audio signal and a transmitter for transmitting an audio signal,
characterised by a mobile receiver (30) for receiving radio beacon signals, an output unit (32) for deriving and outputting a signal from the received radio beacon signals and a transmitter (34) for outputting the derived signal to a control unit for controlling aids.

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ABSTRACT
For
DEVICE FOR CONTROLLING EQUIPMENT FOR PUBLIC EVENTS

The invention provides an installation for controlling aids (8, 9, 10, 12) for public functions, in particular sound irradiation and/or illumination systems. The installation comprises a control unit. At least one mobile object, in particular an (audio) signal source, as well as one or more aids to be controlled, can be connected to the control unit. The installation comprises control means for controlling the aids. Provided in the installation is a locating device for locating a relevant position, for instance the position of an actor, which outputs a position signal indicating the relevant position to the control unit. Moreover, the control unit controls the aid or aids (8, 9, 10, 12) in dependence on the position signal.

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**Altera Law Group, LLC**

Declaration and Power of Attorney Patent Application (Design or Utility)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **DEVICE FOR CONTROLLING EQUIPMENT FOR PUBLIC EVENTS**

the specification of which

- ☐ is referred to by Altera reference number on a separate document
☐ is attached hereto
☒ was filed on 3 November 2000 as application serial no. _____ and or PCT International Application number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

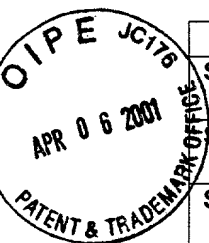
I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information know to me to be material to patentability as defined in 37 C.F.R. §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or 35 U.S.C. §365(b) of any foreign application(s) for patent or inventor's certificate, or 35 U.S.C. §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate of PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)		
Number 199 53 003.3	Country Germany	Day/Month/Year Filed 4 November 1999
Number	Country	Day/Month/Year Filed
Number	Country	Day/Month/Year Filed

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I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:



Prior Provisional Application(s)	
Serial Number	Day/Month/Year Filing Date
Serial Number	Day/Month/Year Filing Date
Serial Number	Day/Month/Year Filing Date

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or under 35 U.S.C. §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

Prior U.S. or International Application(s)		
Serial Number	Day/Month/Year Filed	Status (patented, pending, abandoned)
Serial Number	Day/Month/Year Filed	Status (patented, pending, abandoned)
Serial Number	Day/Month/Year Filed	Status (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Altera Reference No.: 635.324USW1

Power of Attorney

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Steven R. Funk Reg. No. 37,830
David W. Lynch Reg. No. 36,204
Karen D. McDaniel Reg. No. 37,674

Mark A. Hollingsworth Reg. No. 38,491
Michael B. Lasky Reg. No. 29,555
Iain A. McIntyre Reg. No. 40,337

I hereby authorize them or others whom they may appoint to act and rely on instructions from and communicate directly with the person/organization who/which first sends this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Altera Law Group, LLC otherwise.

Please direct all correspondence in this case to Altera Law Group, LLC at the address indicated below:

Michael B. Lasky
Altera Law Group, LLC
10749 Bren Road East, Opus 2
Minneapolis, MN 55343

Full Name of Sole or First Inventor		
Family Name Niehoff	First Given Name Wolfgang	Second Given Name
Residence and Citizenship		
City of Residence Wedemark	State or Country of Residence Germany	Country of Citizenship Germany
Post Office Address		
Street Address Auf der Horst 9C	City 30900 Wedemark	State & Zip Code or Country Germany
Signature of Inventor <i>Wolfgang Niehoff</i>	Date 19.12.2000	

Full Name of Second Inventor, if any		
Family Name Haupt	First Given Name Axel	Second Given Name
Residence and Citizenship		
City of Residence Langenhagen	State or Country of Residence Germany	Country of Citizenship Germany
Post Office Address		
Street Address Jobstkamp 46	City 30855 Langenhagen	State & Zip Code or Country Germany
Signature of Inventor <i>Axel Haupt</i>	Date 18.12.2000	

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